Revised Small Business Economic Impact Statement

Chapter 173-505 WAC

Instream Resources Protection and Water Resources Program

Stillaguamish River Basin

Water Resources Inventory Area (WRIA) 5

August 2005

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Prepared by: Washington State Department of Ecology
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BACKGROUND

The Washington State Department of Ecology's (Ecology) Water Resources Program provides an instream resources protection and water resources program for the Stillaguamish River basin to:

- Retain perennial rivers, streams, and lakes in the Stillaguamish River basin with instream flows and levels necessary to protect and preserve instream values, and instream flows. Closures are included along with numeric instream flows at specific points in the basin.
- Provide for an adequate and safe supply of potable water to satisfy the domestic needs of households and small businesses and for stockwatering via the establishment of two reservations of water.
- State Ecology's policies to guide the protection, utilization and management of Stillaguamish River basin surface water and interrelated groundwater resources for use in future water allocation decisions.

The Stillaguamish River Basin is designated as Water Resource Inventory Area 5 (WRIA 5) in chapter 173-500 Washington Administrative Code (WAC). The rule is chapter 173-505 WAC. Ecology is developing and issuing this revised Final Small Business Economic Impact Statement (SBEIS) as part of its rule adoption process and pursuant to chapter 19.85 RCW. Ecology used the information developed in the SBEIS to ensure that the rule is consistent with legislative policy.

DESCRIPTION AND PURPOSE OF THE SBEIS

The objective of this SBEIS is to identify and evaluate the various requirements and costs that the rule might impose on business. In particular, the SBEIS examines whether the costs impose a disproportionate impact on the State's small businesses. The specific purpose/required contents of the SBEIS can be found in RCW 19.85.040.

1. COMPLIANCE COSTS FOR WRIA 5 BUSINESSES

INTRODUCTION

The evaluation of the impacts of the rule is based on analysis and comparison of water right management without the rule and after the effective date of the rule. The current water right administration is based on an extensive and complex legal and administrative framework. The framework includes administrative procedures for applications for both new water rights and changes to exiting water rights, and the use of water by permit-

exempt wells (RCW 90.44.050). Implementation of Chapter 90.22 RCW and Chapter 90.54 RCW are also part of this legal baseline. By reserving water and closing streams and rivers, the rule creates new conditions that must be considered when making future water right decisions. A brief description of compliance requirements is provided below. A detailed description of water management under the existing rules and this rule can be found in Appendix B.

WATER RIGHT ADMINISTRATION UNDER THE RULE

The new water right management program will close, or seasonally close, rivers and streams and reserve specific quantities of groundwater for year-round future domestic uses of households and businesses. The rule creates a reservation for future stockwatering and establishes eligibility conditions for use of the reservations. Expected impacts to water management include the following:

Surface Water: For streams with flows available at least part of the year, the decision process will be much the same as prior to the rule. Currently, Ecology will condition a water right in such a way that flows are protected and a permit can be approved granting an interruptible right. Under the rule, new surface water rights will either not be granted in closed basins or will be required to stop withdrawing during the seasonal closed periods or when minimum instream flows are not met in the surface water source. In general, this may represent a significant change for future proposed surface water withdrawals since currently they would only be required to stop withdrawing water during low flow periods. Those proposing withdrawals from lakes or ponds will be allowed to withdraw up to 150 gallons per day for in-house use only. This reduces what would be obtained absent the rule.

Applications for new consumptive surface water rights during the closure periods would be denied, unless the applicant proposes, and Ecology accepts, mitigation of the water use or unless an interruptible right is acceptable to the applicant. An uninterruptible right may be approved on a case-by-case basis. For areas currently included in Ecology's Surface Water Source Limitations (SWSL) list, about 30% of the basin, the rule would represent little change from the current situation except for those obtaining water from the reservation. Proposed appropriation from a stream listed in the SWSL are currently either denied or conditioned on low flow requirements. However, for areas that are not currently included in SWSL, this may represent a change because potential water right holders would have to cease use of water every year instead of just during the low-flow closure periods as would be the case for a conditioned right. In accordance with the requirements of RCW 90.22.040, Ecology is retaining water instream for future stockwatering from surface water sources.

Groundwater: The decision process is much the same as prior to the rule. Groundwater applications in hydraulic continuity where withdrawal would affect flow in the rivers and streams will be subject to the instream flows unless they are eligible for the domestic reservation. Applications for new consumptive ground water rights from sources that are closed part of the time would be approved as interruptible rights or denied, unless the applicant proposes, and Ecology accepts, mitigation of the water use, or unless the

applicant shows that the withdrawals will not affect surface water. An uninterruptible right may be approved on a case-by-case basis. For areas currently listed under Ecology's SWSL list, this would represent little change from the current situation except for those obtaining water from the reservation. However, for those areas that are not currently listed on the SWSL this may represent a change because they would not be able to use water in areas with year-around closures and will likely be required to curtail use more frequently in those cases where closures are only part of the year.

Based on the hydrogeology of the basin, and the location and depth where groundwater withdrawals generally occur, future groundwater withdrawals have a high likelihood of capturing water that would result in impacts to surface water flows and levels in the Stillaguamish River Basin. The rule does not create the need for, and does not change the standards for, the analysis regarding whether these impacts cause impairment.

Permit Exempt Groundwater: A reservation of ground water for future domestic uses provides a management framework for these withdrawals. One factor influencing the impacts of the rule is whether the local governments submit a written acknowledgement to the department that confirms that any legally required determinations of adequate potable water for building permits and subdivision approvals will be consistent with applicable provisions of this chapter. If this acknowledgement is not put in place, the reservation will not be available to new uses in that area until such time as this action is taken. The analysis below assumes the local governments act to make the reservations available within their jurisdictions.

For businesses interested in using a permit exempt well, there would be several alternatives. For wells that would be drilled in areas where impairment would result, options include:

- obtaining water from the reservation
- accepting an interruptible water right in partially closed basins with corresponding curtailment or required storage
- agreeing to mitigate the impacts, generally through water transfers.

In areas where hydraulic continuity between the surface water and groundwater is not likely applicants could solicit a hydrogeologist to certify that a well would not cause impairment of a water right. Ecology would have to approve this certification. This would allow an applicant to develop a well as though the rule was not in place, but at the additional cost of the analysis. For some wells in basins that drain groundwater to saltwater bodies, this cost would likely be very small.

A new groundwater withdrawal under this reservation is not allowed in areas where a municipal water supply has been established and a connection can be provided by the municipal supplier. The rule is implementing RCW 43.20.260. If an applicant for a building permit or subdivision approval cannot obtain water through a municipal supplier, the applicant must obtain a letter from a municipal supplier prior to drilling a well which states that service was denied. This may result in increased costs, including connection charges, construction charges and monthly water rates. For future stockwater, Ecology is reserving 20 acre-feet of groundwater on an annual basis.

Changes or Transfers of Water Rights: Existing water rights can continue to be changed or transferred as permitted by Chapters 90.03 and 90.44 RCW and the process is the same as before the rule. However, under the rule, changes to surface water rights will not be allowed if they impair instream flows.

Reservations of water: The use of water under the reservations, and associated conditions for that use, are part of the rule. In large measure, the domestic reservation will allow residential and some business development to continue as before. Some businesses may benefit from having a continuous, reliable source of water during low flow periods, with few restrictions. The restrictions include a limit on outside watering, a requirement to connect to a municipal water supplier under certain circumstances, and the finite quantity of the reservation. Domestic water use must also meet efficiency standards but this is not a change from existing requirements. The stockwatering reservation will provide uninterruptible water supplies for those types of businesses.

Closures of Water Sources in WRIA 5: The rule would include the current limitations for surface water sources, and add limitations to several other streams and rivers. For applicants who cannot access the reservations, applications for consumptive uses from sources closed during certain portions of the year will be denied unless the applicant can either acceptably mitigate for the impacts during the closure periods or demonstrate to the satisfaction of the department that the proposed withdrawal will not affect instream flows set by rule. In partially open areas, interruptible water rights may be issued.

IMPACTS TO BUSINESSES IN WRIA 5

Several potentially significant impacts to businesses in WRIA 5 are likely and are described below:

1. Lake and pond consumptive withdrawal restrictions: Surface withdrawals from all lakes and ponds will be limited to single in-house domestic uses not to exceed 150 gallons per day per home under the rule. Currently, applicants may get a right to a larger quantity of water but may be required to reduce use to in-house domestic during low flow conditions. The in-house use limitation under the rule may impact some businesses desiring access to these sources or develop residential lots. However, some businesses may get a slightly greater quantity of groundwater from the reservations. The exact impact of these restrictions on use from lakes and ponds will depend on the number of permit requests that would have been submitted absent the rule, and the required water needs.

2. Stream closures: All rivers and streams will be closed to further appropriations. This includes all ground water hydraulically connected to those surface waters, the withdrawal of which will have an effect on the flow or level of the rivers and streams. For other than domestic uses (human needs of a household or business) and stockwatering authorized under the reservations, this requirement will generally eliminate new water withdrawals during the year (in fully closed areas) or part of the year (in partially closed basins).

Domestic uses will be allowed in these closed areas through the reservation but only for domestic needs.[1] New withdrawals may still be available for non-consumptive, fully mitigated projects, or from groundwater shown to not affect surface water. In some areas, water uses not eligible for the reservation will be required to obtain water during closure periods from an existing water purveyor, through leases or transfers or through other methods.

For those businesses that require water for irrigation or for agricultural/industrial processes, this might be an impact on future withdrawals since the closure will require some mitigation or storage. However, it is reasonable to conclude that these water uses would have been conditioned on low flows absent the rule. As such, the impact would likely be a longer period of non-use that will occur every year instead of just low flow years. This could require water leasing or transfers of existing water rights or could lead to a change in the location of a commercial industry or agricultural use. The magnitude of the impact will be determined by the location and use of future water permit applicants.

3. Creation of the reservations: Currently, groundwater withdrawals via permit exempt wells in the Stillaguamish River or its tributaries are subject to the requirements in RCW 90.44.050. Under the rule, water from permit-exempt wells for domestic, small businesses and stockwatering will still be available via the reservations, but comes with some restrictions. Under the reservation, only domestic uses will be allowed year around. For businesses that would typically use a relatively small amount of process water (up to 5,000 GPD), domestic needs of the business could be met from the reservation and for a business located in areas with partial closures an interruptible right would still be available during open periods. For businesses developing land for residential construction or requiring domestic water only, the reservation should meet that need although outdoor use will be restricted to irrigation of $1/12^{th}$ of an acre per residence.

The reservation of water for stockwatering will likely provide year-around access to groundwater for new stockwatering uses. Currently, water that would be accessed via permitted wells in continuity with the river or its tributaries is likely to be conditioned, so the rule is likely to be a benefit to this industry.

4. Connection requirements: Projects developed within a municipal water supplier's service area will be required to connect to the supplier if a connection is available. In general, this will impact water for domestic needs or process water. This may be an impact to some businesses in the area.[2] An exception might be a business that doesn't require water during low flow periods, but this is likely to be a small subset of future businesses in the watershed.

5. Transfers: Water right transfers that would have occurred despite impaired instream flows will no longer be allowed. This may be a cost for those that would have transferred

[1] Currently, permit-exempt well users can used up to 5,000 GPD during all periods assuming they meet the other requirements of chapter 90.44 RCW.

[2] Other entities may already require connection. For example, the Skagit County Critical Areas Ordinance requires connection to public water systems to protect low flows under specific conditions.

water. However, only two transfers of any kind for small quantities have been recorded previously. Therefore, it seems reasonable to conclude that this impact will be small. Down stream transfers of water rights may become part of mitigation strategies used by businesses. Thus the cost may rise over time.

6. Impacts to businesses depending on instream flows

Creation of the reservation, stream closures, and restrictions on withdrawals from lakes and ponds will reduce the amount of water that could have been withdrawn without the rule. This could potentially be a beneficial impact to ecosystem services and recreation, and could impact property values. For businesses that provide guide services such as rafting, fishing and bird watching, or those dependent on dilution for waste removal, there could be a very minor beneficial impact. However, the business benefit of a reduced depletion in flow is likely to be small due to the small quantities of water involved.

7. Impacts to existing permitted water rights

Increasing requirements for future water rights may increase the value of existing permitted water rights to some businesses.

COST ANALYSIS

The following cost analysis (as required in RCW 19.85) is provided:

Reporting and Recordkeeping: Additional reporting or recordkeeping may be required if reporting of metering is necessary to manage the reservation. Metering is required under WAC 175-175 and the cost is therefore not estimated here.

Additional Professional Services: Additional professional services including hydrogeological expertise and engineering design and surveying may be required if technical services are required to provide technical documentation of a water transfer or if a water line extension must be designed. Closures in basins may lead some to transfer water rights or lease from others. This will likely require increased use of professionals including hydrogeologists, biologists, engineers, and attorneys. The exact requirements would depend on the river or stream, proposed change, etc. Mitigation options might involve construction of storage tanks and associated piping requiring engineering design services, transfer of water rights. Anyone required to connect to a municipal water supplier's system would likely require additional engineering design and surveying. Costs for hydrogeologic analyses were estimated to vary from $1,000 to $100,000 depending on the extent of analysis required.[3]

Costs of Equipment, Supplies, Labor, and Increased Administrative Costs: Increased equipment associated with pipeline and tank construction may be required for mitigation options but is included in the descriptions below.

Other Compliance Requirements: Restrictions on water use from lakes and ponds may require some businesses to obtain groundwater rights through the reservation or

[3] Based on conversations with geotechnical consultants.

potentially install storage or mitigate another way. The exact impact will depend on the number of proposed water rights, and the volume and time period in which water is required. A review of past surface water rights issued to business entities indicate that none have been issued since 1985.[4]

Basin closures will impact those that would have applied for an interruptible water right since they will now not be issued a water right in fully closed basins unless they can mitigate, or demonstrate no impacts on instream flow. In general, it is difficult to determine the cost impact of this requirement since it depends on the number of surface water withdrawals or wells proposed to be installed in the future, the required quantity of water, and cost of other options such as purchases or leases of existing rights. For businesses that require water for location specific activities, this might change the highest-valued use of the land. Evaluation of past permitted uses by businesses indicates that the predominant uses are for domestic and irrigation.[5] In these areas, domestic uses can still be served by individual wells through the reservation. Future irrigation uses would likely obtain water through transfers or via storage or mitigation. Agricultural transfers have typically been priced from $40/acre-foot to $120/acre-foot. Storage would likely involve construction of a trench with liner and this cost could range from $25,000 to $35,000 per acre-foot of storage.[6] Mitigation costs vary with the proposed alternative. It is important to note that the impact of the rule is the change between an interruptible permit that would be interruptible 75-90 days per year and one that would only be open during limited periods of the year. If purchase or lease of rights is currently cost effective as seems apparent from the data, then the impact from the rule would likely be relatively small.

Costs associated with the reservation include the reduced ability to use water for outdoor use. This is considered in Section 2. The cost to connect to an existing water system will range from $8,000-$35,000 for those businesses required to connect including professional services.[7] However, some of that cost (all, in some cases) will likely be returned via latecomer agreements and the applicant will avoid the cost of constructing a well which is approximately $7,000 depending on the depth, geology, etc.[8] In general, it would seem likely that businesses would find it in their interest to connect to an existing water system under the requirement. Professional service costs will vary depending on the project but are typically 10-15% of the construction cost of specific projects.

The cost associated with the rule restricting any transfers that would but for the rule have been completed will be the difference in value the proposed user and seller placed on the water. This will vary with the applicants, water uses, transfer conditions, value of water in the business product and the businesses.

[4] This would not include water rights issued to individuals for business purposes.
[5] Since 1985, Ecology annually issues approximately 1 permit to business entities with the majority of those issued prior to 1996.
[6] Assumes construction of a trench with bentonite liner.
[7] This cost will be more a function of the municipal water supplier's public water policies than the rule.
[8] Cost estimate assumes 60 foot deep well through sand and gravel.

2. REVENUE IMPACTS AND DISTRIBUTION OF COSTS

INTRODUCTION

RCW 19.85.040 requires that additional analysis of impacts be provided. Specifically, the analysis should include whether compliance with this rule will cause businesses to lose sales or revenue and whether the rule will have a disproportionate impact on small business. This section evaluates the rule in light of these requirements.

REVENUE IMPACTS

The rule will only affect future water rights and transfers. Increased costs for businesses will likely impact those that require water for their processes or that will rely on permit-exempt wells for land development. Some additional costs may also be imposed for those businesses that are required to connect to municipal water supplier's systems. In most cases the impact will be borne by those businesses that own developable property. Firms that develop land for their own use or for sale as residential land may experience a reduction in land value associated with the reduced availability of water. The estimated cost of outdoor use restrictions to users of permit exempt wells is likely to be between $3 and $35 per year per well.[9] Capitalizing this over time yields a reduction in value of between $44 and $545 per well.[10] This is the cost that would be experienced by any firm that owns developable property likely to be served by an exempt well. For those business using conditioned water right permits, the restrictions on use during low flows will impose a cost varying with the volume and use forgone. Other impacts (e.g. connection requirements, restriction on transfers, etc.) will also tend to raise costs. To the extent that increased costs yield increased prices, gross revenues may be reduced.

DISTRIBUTION OF COMPLIANCE COSTS

The impacts of the rule related to the reservation and closures will likely be experienced by existing property owners without existing water rights. Assessing the impact of the rule and proportionality for small and large business involves evaluation of the ownership structure of existing parcels in the watershed.[11] To determine proportionality, all existing properties within the watershed were analyzed. The number of business-owned developable properties was determined, and this was evaluated to determine those likely to be served by exempt wells in the future. The result was a record of existing business owners, parcel size and current land use and zoning that allowed for projection of the number of wells that could be developed. The ownership data was then matched with Washington State Employment Security (ESD) Records to determine the size (i.e. number of employees) of firms. This allowed for an analysis that evaluated alternative development scenarios. It is possible that no land would be developed, that all is developed or any of a multitude of combinations in between. The results assuming full-development by all business-owned parcels is provided in Table 2.1.

[9] Costs may be higher for development from surface water on lakes and ponds.
[10] Calculation assumes a 20 year cost at 2.7% real discount rate. Discussion can be found in the benefit-cost analysis.
[11] Business-owned developable parcels make up approximately 22% (Skagit County) and 21% (Snohomish County) of the total area in the counties located in the watershed.

Table 2.1. Compliance Costs for Business-Owned Exempt Well Development

	Number of Firms[12]	Average Employment (No. of Employees)	Average Cost per Employee [13] ($)	Median Cost Per Employee ($)
Small Firms	55	6-15	$580-$7,183	$70-$863
Large Firms	17	475-795	$2-$19	$2-$19

As can be seen from above the impacts appear to be greater on a cost per employee basis for smaller firms than for larger firms with a cost/employee ratio for small to large firms of 1:35 using the median cost per employee. This result is conditional on all parcels developing the maximum number of exempt wells. If firms develop the same number of wells or if small firms are the only firms to develop, then the costs would also be disproportionate. If large firms were the only to develop, then this may not be the case.[14]

An analysis was also carried out to determine the proportionality of impacts on permitted surface and groundwater users. All businesses that previously applied for and received permits for surface or groundwater use (since 1985) were small firms. For any new agricultural users that elect to purchase or lease water for irrigation, it is likely that the impacts will be disproportionate. Other cost impacts such as professional services, etc. are likely to be higher cost (on a per employee basis) for small firms than for large.

CONCLUSIONS

As described above, there will likely be an impact to some businesses in the watershed from the rule. It is likely that some firms will experience increased compliance costs associated with restrictions on water use, purchase or water or mitigation and water line extension costs. In general, the impacts are likely to be disproportionately borne by smaller firms as measured on a cost per employee basis.

3. ACTIONS TAKEN TO REDUCE THE IMPACT ON SMALL BUSINESS

As described above, the rule could affect some of the businesses in the watershed. It appears this may disproportionately impact small businesses. In crafting the instream flow rule, Ecology has actively attempted to reduce, modify or eliminate substantive regulatory requirements to all entities in the watershed. For example in a previous draft of the rule, Ecology considered prohibiting all outdoor uses of water during low flow periods. The rule allows some outdoor watering which will reduce the impacts to small businesses proportionately more than large businesses. The requirement that well users must hook up to the municipal water supplier once water becomes available has also been dropped. The maximum stock watering per user volume limit was deleted and the total annual volume had been increased to 20 acre feet. There are no recordkeeping or

[12] The total number of firms represents all businesses located in the county listed as owner of the parcel and where ESD data could be located.
[13] Cost comparisons use the largest 10% of firms required to comply.
[14] For Skagit County, the firm size and cost structure is such that all possible development scenarios involving at least one small parcel developing for the parcels considered result in disproportionate impacts.

reporting requirements or inspections and compliance timetables and fine schedules were not altered.

4. HOW WAS SMALL BUSINESS INVOLVED IN THE DEVELOPMENT OF THIS RULE?

This rule has been developed over a long period with substantial public involvement. Several public meetings were held to discuss the language and the rule was posted on Ecology's website. The filing of the CR-102 provided for official public hearings to consider the rule and an opportunity for the business community to provide input.

5. LIST OF INDUSTRIES REQUIRED TO COMPLY

No industries are required to comply with the rule unless they seek to obtain new water rights in the area. However, requirements affecting water use are likely to translate into changes in property values based on impacts to the highest valued uses in the watershed. As such, existing business owners of undeveloped property are likely to be the industries that will be required to "comply" either directly in terms of attempting to acquire water or indirectly in terms of changes in asset values. Therefore, the following list is provided indicating Standard Industrial Codes (SIC) codes for existing developable properties in the Stillaguamish watershed[15] and based on previous water right permit data.

Table 5.1. Industries Likely Required to Comply with the Rule

SIC Code	Description	SIC Code	Description
1442	Construction sand & gravel	5154	Livestock
1521	Single-family housing construction	5193	Flowers & florists' supplies
1794	Excavation work	5261	Retail nurseries and garden stores
2011	Meat packing plants	5261	Retail nurseries and garden stores
2038	Frozen specialties, nec	6021	National commercial banks
2411	Logging	6211	Security brokers and dealers
2421	Sawmills and planing mills, general	6531	Real estate agents and managers
2621	Paper mills	6552	Subdividers and developers, nec
2653	Corrugated and solid fiber boxes	7032	Sporting and recreational camps
2676	Sanitary paper products	7999	Amusement and recreation, nec
4011	Railroads, line-haul operating	8051	Skilled nursing care facilities
4612	Crude petroleum pipelines	8121	Unassigned
4911	Electric services	8322	Individual and family services
4941	Water supply	8399	Social services, nec
4952	Sewerage systems	8611	Business associations
5031	Lumber, plywood, and millwork	8641	Civic and social organizations
5032	Brick, stone and related materials	8661	Religious organizations
5099	Durable goods, nec	8731	Commercial physical research
5114	Unassigned	8733	Noncommercial research organizations

[15] The table was based on data provided by the Skagit and Snohomish County Assessors and by the Washington State Employment Security Department.

APPENDIX A-REFERENCES

1. AWWA Research Foundation, Residential End Uses of Water, American Water Works Association, 1999

2. Economic and Engineering Services, Inc., North Snohomish County Coordinated Water System Plan, 1991

3. RS Means, Building Construction Cost Data, 55th Annual Edition, 1997

4. Skagit County, Skagit County Comprehensive Plan, 2003

5. Snohomish County, Snohomish County Permit Search, http://198.238.192.103/pds/pdskiosk/PDS-SearchPN.asp, Accessed 2004

APPENDIX B-RULE ANALYSIS

INTRODUCTION

Ecology anticipates that a significant portion of the rule's implementation will be related to water rights and water management. Water rights and water management are governed by a series of statutes and court cases. Compliance with the rule will occur primarily within the context of complying with state water laws. Evaluating the impacts of the rule involves describing the baseline from which the change caused by the rule is measured. The baseline includes water right administration for both new and changes of water right applications under chapters 90.03 and 90.44 RCW and case law. It also includes the use and development of water by permit exempt wells pursuant to RCW 90.44.050. For the consideration of instream values, chapter 77.55 RCW and current implementation of chapter 90.22 and 90.54 RCW as they relate to water rights and water management is also part of the baseline.

In creating the reservations of water, and establishing instream flows, the rule creates a mechanism that allows for future uninterruptible domestic water uses and stockwatering. In the case of the stream closures, the rule's effect will likely be on future determinations of water availability. Consideration of water availability is part of the water right application process. The four-part test for a water right from RCW 90.03.290 remains unchanged and includes examination of water availability. The rule will quantify water availability for some uses through the reservation and establish new water rights for this watershed. Conditions may be imposed on a future water right to implement the rule. How the rule changes consideration of requests for new water and or changes to water rights and in particular how environmental values are reflected in the decisions prior to and after the rule are described below.

BASELINE DEVELOPMENT

Under State water law, the waters of Washington collectively belong to the public and cannot be owned by any one individual or group. Proposed diversions of any amount of water for any use from all surface or groundwater sources require a water right be obtained. A water right is a legal authorization to use a certain amount of public water for a designated purpose. A water right is also necessary if you plan to withdraw more than 5000 gallons of ground water.

An application for a ground water right permit is not required if your daily ground water use from a well or wells will be 5,000 gallons a day or less for any of the following combinations of uses:[16]

- Stock-watering.
- Single or group domestic purposes such as drinking, cooking and washing.
- Industrial purposes.
- Watering a lawn or noncommercial garden that is a half acre or less in size.

[16] Publication #F-WR-92-104.

Although the law allows an exemption from the water right permit process in these cases, all other water laws and regulations still apply to these uses.

Washington water law requires users of public water to receive approval from the state prior to the actual use of water. Approval to put water to beneficial use is granted in the form of a water right permit. The proposed use must meet four primary requirements (known as the "four-part test") in order for Ecology to issue a water right permit:

1. The water will be put to beneficial use;
2. There will be no impairment to existing rights;
3. Water is available; and
4. The water use will not be detrimental to public welfare.

Ecology conducts an investigation of the application to confirm the information on the application and applies the four-part test mentioned above. In applying this four-part test, some of the facts Ecology considers are based on the particular water source, existing water rights, and watershed. These include the instream flow recommendations made in the past, instream flow rules (if they exist) and whether and how groundwater is connected to surface water sources. The results of the investigation and four-part test review are summarized in a report of examination (ROE). The ROE contains Ecology's staff-level decision on a water right request. Ecology can recommend a denial, an approval, or an approval with conditions. Once approved by an Ecology decision-maker, Ecology issues a final ROE and orders approving the ROE. If approved, the permit will likely have specific conditions.

Instream flow considerations within water right application administration has been the law since 1949 (See RCW 77.55.050). Generally, a flow of water sufficient to support game fish and food fish populations must be maintained at all times in the streams of this state. Under that statute, Ecology sends copies of water right applications to the Washington Department of Fish and Wildlife (WDFW) to see if approving the proposed withdrawal would compromise game and food fish populations. In 1969, by adoption of Chapter 90.22 RCW (Minimum Water Flows and Levels) and again in 1971, by adoption of the Water Resources Act, the Legislature added additional policies for instream flow considerations and the instream flow rule program. Instream flows once adopted by rule are water rights protected from impairment from those rights junior in priority date to the instream flows (RCW 90.03.345). Ecology is prohibited, by statute, from allowing withdrawals of water that conflict with an instream flow regulation, unless there is a clear showing of overriding consideration of public interest (RCW 90.54.020(3)(a)). Numerous water sources in WRIA 5, about 30% of the basin, are listed on Ecology's Surface Water Source Limitation List (SWSL) based on past comments of resource agencies pursuant to RCW 77.55.050.

The consideration of a proposed withdrawal's impact on fisheries resources and flow is performed by professional fisheries biologists based on professional judgment using the existing data and/or knowledge of the basin. If there is concern that approval of an application for a water right might compromise instream values, the application can

either be denied or conditioned on minimum flow levels. A junior water right must stop withdrawing water, if a senior right is not satisfied. Consequently, rights conditioned upon minimum flow levels are interruptible water rights that must cease during times when streamflows are below the established flows. In the case of the Stillaguamish River, there is no existing in-stream flow rule in place and water rights are currently approved according to existing law. The current water management program can be summarized as follows:

Surface Water Allocations (water right permit)
New applications for surface water rights are forwarded to the WDFW for review and comment. The four-part test is applied. If there is a concern that water uses might adversely impact fish, WDFW will recommend that the right not be issued or that any use granted be conditioned on minimum flows. In most cases Ecology will accept WDFW's recommendation and condition the right in such a way that flows are protected. A permit is approved granting an interruptible right.

Groundwater Allocations (water right permit)
New applications for ground water rights are, generally, subject to the same requirements as for surface water rights. All applications are reviewed by WDFW. The four-part test is applied. If there is a concern that water uses might adversely impact fish, for example due to hydraulic continuity, WDFW will recommend that the right not be issued or that any use granted be conditioned on minimum flows. In most cases, Ecology will accept WDFW's recommendation and condition the right in such a way that flows are protected. The impact of a ground water withdrawal on a surface water body (stream or lake) through hydraulic continuity is generally estimated based on aquifer characteristics and accepted hydrogeologic study methods.

Historically few approved ground water uses were issued interruptible with a condition on instream flows. After the 1980's that practice changed. The science of ground water development and tools for assessing ground water flow became more advanced. Moreover, Ecology's understanding of the law on ground water hydraulic continuity was shaped, in part, by the Supreme Court's decision in *Postema v. Ecology (2000).* Now a ground water development's impact to existing wells and surface water sources is evaluated within the impairment analysis.

Groundwater Allocations (permit exempt)
New ground water can be obtained from permit-exempt wells under specific conditions (RCW 90. 44.050). The groundwater permit exemption is an exemption from a water right permit application; all other water laws and regulations still apply. Currently, the local health district and building permit officials determine when permit exempt wells can be used. In general, there are few restrictions on location except for sanitary setbacks.

As a water right, use of a permit exempt well can be regulated in favor of senior rights if it impairs an existing right, including instream flows. Historically, Ecology has rarely regulated these water rights to protect senior water rights.

Changes or Transfers of Water Rights (Water Right Permits)
Existing water rights can be changed or transferred pursuant to chapters 90.03 and 90.44 RCW.

Reservations of water
There is no existing reservation of water within WRIA 5.

Closures of water sources in WRIA 5
There are currently several streams listed on Ecology's SWSL list that would either be denied or conditioned on low flows in WRIA 5. Closures are based on a finding of no water availability, generally because the available supply has been fully allocated.

RULE IMPACTS TO WATER RIGHT ADMINISTRATION

The future water right management program under the rule can be broken down as follows:

Surface Water Allocations (water right permit)
Under the rule, water rights issued after the effective date of the rule will be "junior" to the established instream flow rights and be required to stop withdrawals when minimum flows are not met. In general, this is not likely to represent a significant change for future proposed surface water withdrawals because prior to this rule, the water right applications were evaluated by WDFW for instream flow considerations and usually conditioned. Applications for new surface water rights from closed sources would be denied, unless the applicant proposed mitigation of the water use or the use was approved subject to over riding considerations of the public interest. For those areas currently closed (on the SWSL), this would represent no change from the current situation. For areas that are not currently closed, this may represent a change. The rule will ensure uniformity and consistency in flow determinations and resultant instream flow provisos.

The rule will close all lakes to consumptive water use, except for single domestic supply. For single domestic supply, in-house use of only 150 gpd will be allowed.

Groundwater Allocations (water right permits)
New applications for ground water rights are, generally, subject to the same requirements as surface water rights. The four-part test is applied. In most cases, Ecology will evaluate the impact of a ground water withdrawal on a surface water body (stream or lake) based on aquifer characteristics and accepted hydrogeologic study methods. If the proposed appropriation were to capture water, that would otherwise contribute to instream flows, the permit approval would be conditioned to protect against impairment of the instream flow right.

Applications for new ground water rights from closed sources would be denied, unless the applicant proposed mitigation of the water use or the use was approved subject to over riding considerations of the public interest. For those areas currently closed, this would represent no change from the current situation. However, for areas that are not currently closed, this may represent a change since new ground water rights would be

denied, unless the applicant proposed mitigation of the water use or the use was approved subject to over riding considerations of the public interest.

In the past, not all groundwater rights have been conditioned due to the difficulty in knowing the degree of continuity to surface sources. The rule clarifies the applicant's responsibility in demonstrating that groundwater extraction will not impair other rights. However, the impact created on the surface water source via hydraulic continuity is not necessarily impairment. A separate test is required to analyze the possibility of impairment from withdrawals of ground and surface waters in continuity with the proposed source. This rule does not affect this statutory requirement.

Groundwater Allocations (permit exempt)

Some portions of the Stillaguamish basin are closed to new ground water development during some periods of the year under the rule, with exceptions provided for in the rule. The reservation of permit-exempt ground water will provide a management framework for future single and group domestic, and small business withdrawals. Because access to the reservations requires local governments to take certain steps, one of the most significant factors influencing impacts from the rule is whether the local governments will recognize the reservation and its conditions as they make decisions on building permits for buildings requiring potable water or on the platting of property.

Access to the reservation is subject to several management conditions including restrictions affecting outdoor use. For individuals and business entities that don't want the restrictions, there are several alternatives. Applicants may choose as a first order of business to solicit a hydrogeologist to certify that a well would not cause an impairment of a water right in those areas where hydraulic continuity is unlikely. This would allow an applicant to develop a well without the limitations imposed by the rule. However, the applicant would bear the additional cost of the analysis. For some wells in basins that drain groundwater to saltwater bodies, the cost for hydrogeologic consultation would likely be very small. For those applicants wishing to use water in areas with a likelihood of hydraulic continuity and consequently, impairment of instream flows, they could get water from the reservation or accept an interruptible water right.

Obtaining water from the reservation requires that an applicant be unable to obtain water from a municipal water supplier. If an applicant can hook up to a municipal water supplier then an application would not be approved.

Changes or Transfers of Water Rights

Existing water rights can continue to be changed or transferred pursuant to chapters 90.03 and 90.44 RCW. Changes to surface water rights and transfers of point of diversion downstream or upstream on a source will now include consideration and potential restrictions due to the instream flow right in the rule.

Reservations of water

The reservation of water, use of the 5 CFS of water under the reservation and associated conditions for that use are all new proposals. In large measure, the reservation will allow

use of permit-exempt wells without an instream flow right condition. These uses are subject to limitations on outdoor watering and other conditions. Use of water under the domestic use reservation is conditioned as follows:

Use of water under the reservation is available only if all the conditions set forth in this section are fully complied with. Conditions for use of the reservation water are:

(a) The reserved water shall be for ground water uses exempt from a water right permit application. This reservation is for either single or small group domestic uses, as defined in WAC 173-505-030(5).

(b) This reservation of ground water shall not exceed 3.23 million gallons of water per day (5 cfs).

(c) Domestic water use shall meet the water use efficiency standards of the uniform plumbing code as well as any applicable local or state requirements for conservation standards.

(d) The reservation shall be applicable only when the appropriate city(ies) or counties submit a written acknowledgement to the department that confirms that any legally required determinations of adequate potable water for building permits and subdivision approvals will be consistent with applicable provisions of this chapter.

Once this chapter is adopted and written acknowledgement is received, the department will promptly notify those city(ies) or counties, the Tribes, water well contractors and the public that the reserve is in effect in those jurisdictions where acknowledgements exist.

(e) It shall be the responsibility of an applicant for a building permit or subdivision approval seeking water under the reservation to comply with the conditions in (a), (b), (c), (e), (f), (g) and (h) of this subsection and all other conditions of this chapter.

(f) A new ground water withdrawal under the reservation is not allowed in areas where a municipal water supply has been established and a connection can be provided by the municipal supplier. If an applicant for a building permit or subdivision approval cannot obtain water through a municipal supplier, the applicant must obtain a letter from a municipal supplier prior to drilling a well which states that service was denied. Such a denial shall be consistent with the criteria listed in RCW 43.20.260.

(g) Outdoor water use is limited to the watering of an outdoor area not to exceed a total of 1/12th of an acre for all outdoor uses under each individual domestic water use. Under all circumstances, total outdoor watering for multiple residences under the permit exemption (RCW 90.44.050) shall not exceed one-half acre.

(h) The department reserves the right to require metering and reporting of water use for single domestic users, if more accurate water use data is needed for management of the reservation and water resources in the area of the reservation. All other ground water users under the permit system shall be required to install and maintain measuring devices, in accordance with specifications provided by the department, and report the data to the department.

When the rule goes into effect, use of the permit-exempt well water will be obtained from a reservation. Businesses that elect to install permit exempt wells for their own moderate needs or to develop saleable land may choose other methods of water well development

(for example drilling to deep aquifers that have no surface water impacts) to meet their needs and avoid limitations imposed by the rule.

The rule creates a future stock watering reservation as directed by RCW 90.22.040. Future stock watering in the rule is accessed via either a diversion structure or wells and relates to normal grazing activities for the surface water use. In addition, RCW 90.44.050 provides an exception to the requirements for a ground water right permit for stockwater. The rule sets a 20 acre foot volume limit for ground water for this use.

Closures of Water Sources in WRIA 5
The rule will include most of the current limitations on water withdrawals based upon the SWSL list but also adds to them. Ecology anticipates denying applications from closed sources unless the applicant can mitigate for the impacts or they can accept an interruptible right. Denial or conditioning on low flows was true before the rule, but after the rule becomes effective the areas subject to closure will enlarge.

Maximum Allocation
There is also a maximum allocation for those periods of the year that the streams and rivers will be open.

RULE (CHAPTER 173-505 WAC)

The complete rule language for "Instream Resources Protection and Water Resources Program-Stillaguamish River Basin Water Resources Inventory (WRIA) 5" can be found in Chapter 173-505 WAC. The following provides a brief description of the rule and a further discussion of those specific rule provisions that may impact instream flows and/or out-of-stream uses of water.

Chapter 173-505-010 General Provisions-Authority and Applicability
This rule is promulgated pursuant to chapter 90.54 RCW (Water Resources Act of 1971), chapter 90.22 RCW (Minimum Water Flows and Levels), and chapters 18.104, 90.42 and 90.44 RCW along with chapter 173-500 WAC (Water Resources Management Program). The rule applies to all future uses of surface water and groundwater hydraulically connected to those surface waters within the Stillaguamish River Basin, also known as Water Resources Inventory Area (WRIA) 5.

Conclusion: No significant economic impact.

Chapter 173-505-020 Purpose
The purpose of the rule is to retain perennial rivers, streams and lakes within the Stillaguamish River basin to protect and preserve instream values, to create a reservation and to set forth the department's policies.

Conclusion: No significant economic impact.

Chapter 173-505-030 Definitions
See the rule.

Conclusion: No significant economic impact.

Chapter 173-505-040 Establishment of Stream Management Units
This section defines control points and the location of the stream management units for the mainstem and north and south forks of the Stillaguamish River and other tributaries.

Conclusion: No significant economic impact.

Chapter 173-505-050 Instream Flows
This section establishes the specific minimum instream flows required for WRIA 5. The flows will be water rights with a priority date of the rule and will be measured on a bi-weekly or monthly basis for specific control points. These flow standards will be the basis for determining when instream flow levels are not being attained and when junior water users (whose use influences flows) will be required to reduce or curtail use. All water rights granted after instream flows are established will be considered "junior" to the specified instream flows.

The rule will apply to all waters within the Stillaguamish River basin (WRIA 5). Specific instream flow standards are set for the Stillaguamish River mainstem, the north and south forks of the Stillaguamish and many tributaries. Minimum flows are also set for several small streams.

Conclusion: Setting minimum instream flows may have significant economic effects-See "Rule Impacts to Water Right Administration."

Chapter 173-505-060 Lakes and Ponds
The rule will limit use of water from all lakes and ponds to single in-house domestic uses not to exceed one hundred and fifty gallons per day per home.

Conclusion: Restrictions on use have significant economic effects-See "Rule Impacts to Water Right Administration."

Chapter 173-505-070 Stream Closures
The rule will close all streams and tributaries in the basin to new consumptive uses except for some periods of the year. Watershed areas contributing groundwater to these areas are also closed to new consumptive water withdrawals. All unappropriated water is to be appropriated for protecting and preserving instream values. Some water is available for appropriations during some periods of the year.

Conclusion: Closing the streams and rivers could have impacts on future water users which may have significant economic effects, but exceptions may limit the impacts-See "Rule Impacts to Water Right Administration."

Chapter 173-505-080 Future Stock Watering

Ecology will reserve surface water and 20 acre-feet of groundwater for future stock watering in the rule accessed via either diversion structures or wells and related to normal grazing activities.

Conclusion: Reservation size was set to meet all future riparian stockwatering areas and access will be allowed essentially the same as before the rule. Surface water users will be able to get an uninterruptible right. Groundwater users will likely not be substantially affected. Significant economic impact may occur- See "Rule Impacts to Water Right Administration."

173-505-090 Reservation of Permit-Exempt Ground Water for Future Domestic Uses
The rule provides for establishment of a reservation of water for domestic uses including the human health requirements of businesses on a year round basis. This would include a maximum allocation of 2 CFS in the north fork and 1.5 CFS in the south fork subject to several conditions. A total allocation of 5 CFS is available. This water shall be reserved for single or small group domestic uses exempt from a water right permit application.

Efficiency standards for the reservation will require that water use meet the Uniform Plumbing Code and local conservation standards, and that the local governments execute an ordinance or other administrative action that indicates they will make a good faith effort to comply with the rule. Use of the reservation will not be allowed if water can be provided by a municipal water supplier. Outdoor watering will be limited to an amount for $1/12^{th}$ of an acre for each individual domestic use for all outdoor uses. Specific accounting criteria for use of reservation water are also included.

Conclusion: Requirements for connection and restrictions on use are likely to have an economic impact. The requirement that local governments submit a letter of acknowledgement prior to the reservation being established may delay or pre-empt reservation establishment. See "Rule Impacts to Water Right Administration."

Chapter 173-505-100 Maximum Allocation
A maximum allocation from certain rivers and streams is also included for those periods of the year that the streams and rivers will be open. This will apply to the mainstem, North and South Forks Stillaguamish River and Pilchuck, Squire, and Canyon Creeks.

Conclusion: This is unlikely to be a limit on twenty year future development in the basin. No significant economic impact is anticipated.

Chapter 173-505-110 Future Permitting Actions
Applicants must demonstrate that any available municipal water supplier's system cannot provide service. Future water availability will be very limited and un-restricted use will only be allowed during closed periods if the proposed use is non-consumptive, the source not in continuity, the use mitigated or the applicant proposes storage. Some salmon recovery projects may be approved. Mitigation is encouraged and will be evaluated on a case by case basis. All future surface and groundwater permit holders will be required to provide measurement devices and report the use data.

Conclusion: Some potential impacts to future water right applicants. Metering requirements are not a change from current requirements. See "Rule Impacts to Water Right Administration."

173-505-120 Alternative Sources of Water
The department encourages the use of alternative sources of water. These may be important as potential mitigating projects when a water use is proposed.

Conclusion: No significant economic impact.

173-505-130 Establishment of Trust Water Rights Program
A trust water rights program will be established to facilitate the acquisition of water rights. No additional program set-up costs are anticipated.

Conclusion: No significant economic impact.

173-505-140 Future Changes and Transfers
Transfers will only be allowed if they don't conflict with this chapter

Conclusion: This may restrict transfers that would have occurred absent the rule. This may have a potentially significant economic impact. See "Rule Impacts to Water Right Administration."

173-505-150 Compliance and Enforcement
To obtain compliance, the department shall produce and distribute technical and educational material. The department will first attempt to get voluntary compliance.

Conclusion: Preparation of educational materials will involve costs.

173-505-160 Appeals
All decisions can be appealed to the pollution control hearings board

Conclusion: No significant impact

173-505-170 Regulation Review
This rule may be reviewed and revised.

Conclusion: No significant impact

173-505-180 Maps
Conclusion: No significant impact

APPENDIX C – ANALYSIS OF IMPACTS TO WATER USERS

Water Use Impacts and Assessment

There are several water users that could be impacted by the rule. These are divided into domestic, agricultural, commercial/industrial, and municipal.

Individual Domestic Water Use

As mentioned in the text, a significant impact to water users is likely to be restrictions on outdoor water use and potentially water reservation limits. The first part of the assessment was performed to determine the estimated amount of growth in the watershed. This was forecast using OFM data and allocations utilized by the Puget Sound Regional Council (PSRC). The PSRC allocates growth based on "FAZ" zones which are aggregates of census blocks. Table D-1 contains the projections.

Table D-1. Population Projections for the Stillaguamish Basin

Snohomish County	**2000**	**2004**	**2010**	**2020**	**2025**	**Change**
Faz No.						
8406	62	76	97	123	125	63
8500	1,015	1,127	1,294	1,463	1,551	536
8925	1,402	1,533	1,728	2,237	2,577	1,175
8926	9,849	10,718	12,023	13,521	14,660	4,811
8927	4,757	5,155	5,753	6,232	6,413	1,656
8935	3,533	3,904	4,461	5,798	6,099	2,566
8936	8,564	9,487	10,872	11,546	12,117	3,553
8937	44	48	55	68	75	31
Subtotal	29,226	32,049	36,284	40,987	43,617	14,391
Skagit County						
Subtotal	244	255	281	305	310	66
Total	29,470	32,304	36,565	41,292	43,927	14,457

As can be seen the forecasted human population growth through 2025 is approximately 14,457 persons. The number of households assuming 2.54 people/household[17] implies a forecast of 5,692 wells to be installed through 2025. Using this projected number, the sufficiency of the reservations to accommodate growth can be considered. Table D-2 contains the result.

Table D-2. Estimated Number of Wells Served by the Reservation

Stillaguamish Portion	**Allowable Reserve**	**Total Wells Served Assuming 175 GPD/connection**	**Total Wells Served Assuming 350 GPD/connection**
North	1.5	5,556	2,778
South	2.0	7,407	3,704
Mainstem Total	5.0	18,519	9,259

[17] From OFM analysis of headship rates.

As can be seen, the reservation should meet the needs of projected rural residential development through 2025.

Exempt Well Restrictions

To quantify some of the economic impacts of the rule, a model was built to evaluate some of the water use restrictions. It considers demand for water and models a quantitative limitation on water use by determining how much the price of water would have to increase to obtain the same water use as that imposed by the rule's quantitative limitation. Surface and groundwater users are modeled as if they were connected to a municipal water supplier's system and required to pay for the quantity of water used. If the price of the water were raised, it would be expected that some reduction in water use would occur. The price that yields the maximum water use allowed in the rule can be calculated and the difference used as a measure of economic impact. For determining the cost impacts of water use, the Snohomish County PUD's prices were utilized. As for most water utilities, water rates are composed of two parts; a flat fee for a base charge and a unit price for use. For this analysis, the relevant price paid is the unit price since the base rate would have to be paid every month for indoor use. In Snohomish County, the unit cost of water is $1.53 per hundred cubic feet (CCF).

Water use in Washington varies based on many factors including location, type of conservation, fixtures, etc. The United States Geological Survey (USGS) has done a significant amount of analysis on water use in Washington and found that for the two counties of interest, the results are as listed in Table D-3.

Table D-3. Average per Capita Water Use in Snohomish and Skagit Counties

	Self-Supplied		Total Domestic	
	Population (Thousands)	**Per capita use (gal/d)**	**Population (thousands)**	**Per capita use (gal/d)**
Snohomish County	103.0	102.9	606.0	100.0
Skagit County	33.9	124.8	103.0	124.0

These values are average values for existing uses. To the extent that new construction may contain more efficient fixtures, it may be an overestimate of use.

Given household size data, the above data can be used to determine average household use in rural areas. Since the new uses to be considered will be part of the self-supplied category, it is likely that these per capita use numbers are more appropriate to use. The results are described in Table D-4.

Table D-4. Estimated Average Self-Supplied Household Water Use in Snohomish and Skagit Counties

	Typical Household Size (No. persons)	**Avg. Household Daily Use (gal/d)**	**Avg. Household Annual Use (gal/yr)**
Snohomish County	2.54	261.4	95,411
Skagit County	2.55	318.2	116,143

The results in Table D-4 are within the range of published estimates of household use.[18]

The next step is determining how much of the annual use is outdoor water use that would be expected if no rule is in effect. Little data exists on residential end-uses, but outdoor water use likely varies a lot within the State based on differences in precipitation, temperature, evapotranspiration and land use and topography. One study that did consider end-use is the American Water Works Association (AWWA, 1999). They performed an evaluation of end uses at several locations throughout the nation and determined average in-house and out-of-house uses.[19] They found that on average, nationwide per capita indoor water use is approximately 69.3 gallons per day with a range of 57.1 to 83.5 gallons per day for the twelve study sites considered. The average indoor water use for Seattle was 57.1 gallons per capita per day. Using the average indoor use rate yields the estimated indoor and outdoor uses listed in Table D-5.

Table D-5. Estimated Indoor and Outdoor Water Use

	Average Annual Household Use (gal/yr)	Average Annual Household Indoor Use (gal/yr)[20]	Average Annual Household Outdoor Use (gal/yr)	Average Annual Household Outdoor Use (CCF/year)
Snohomish County	95,411	64,248	31,163	41.8
Skagit County	116,143	64,501	51,642	69.2

As can be determined, the estimated amount of water used outdoors ranges between 31,163 gallons/year (41.8 CCF/yr) and 51,642 gallons per year (69.2 CCF/yr). Annual household outdoor use in the AWWA study ranged from 7,800 gallons per year to 213,000 gallons per year with an average in Seattle of 21,700 gallons per year. As can be seen, the values listed are significantly larger than the average for Seattle. But outdoor uses in Seattle also involve smaller lot sizes than is typically the case in the rural areas of the counties.

There are two different requirements in the rule that we can evaluate using the above analysis. The first is the rule limit on withdrawals from lakes and ponds to 150 gallons per day per household. From Table D-5, average household indoor use in the counties can be estimated to be approximately 176 gallons per day. This is more than allowed in the rule. However, the results from the AWWA study indicate that typical indoor use in the Seattle area is 57.1 gallons per day per capita or 146 gallons per day. This is likely the result of high efficiency fixtures and education and could likely be achieved in new

[18] (AWWA, 1999) found use values ranging from 69,900 gallons per year per household to 301,100 gallons per year per household.
[19] "Residential End Uses of Water", AWWA, 1999.
[20] Calculation uses household size for each county, and average indoor use value of 69.3 gallons per capita per day.

construction along lakes and ponds. Therefore, it appears that indoor water requirements can be met.

Outdoor uses will be restricted however. As noted in Table D-5, outdoor water needs are estimated to average between 31,200 and 51,700 gallons per year and for lots adjacent to lakes and ponds, there will not likely be any water available for outdoor uses. However, the volumes noted above might be overestimates for lots abutting lakes and ponds since lakeside lots tend to be smaller than an average rural county parcel. To determine the price change that would lead to the equivalent reduction in quantity consumed, a measure of the sensitivity of individuals to price changes is required. This is provided in the concept of "elasticity." Elasticity is the percentage change in quantity demanded divided by the percentage change in price. For example, an elasticity of -1.0 indicates that quantity consumed falls by 1% for a 1% increase in price. To estimate this quantity, elasticity estimates for demand curves from previous research were used.[21] Elasticities for water tend to be quite low which is not surprising for a "necessity" like water ranging from -0.1 to -1.57 depending on the use, time period, etc. However, the elasticity of demand for water for outdoor use is likely to be higher reflecting the lower valued use. AWWA directly evaluated the elasticity of outdoor water use and found the value to be -0.82 which is consistent with the belief that outdoor uses are more discretionary than indoor uses and is the value utilized in this analysis. Given the initial price of water, the use estimates and elasticity measure, the cost impact to surface water users of lakes and ponds is estimated to be in the range of $58 and $244 dollars per year.

The second restriction on water use will impact those that access the reservation through use of exempt wells. The rule will limit water use to an area of 3,630 square feet. Adding the square footage of a typical house footprint yields a lot size of approximately 5,000 square feet. This is the typical size of lots located in the City of Seattle and so the outdoor use numbers found in the AWWA study for the City of Seattle were used as an estimate of the outdoor water needs for the area allowed to be watered in the rule. As was noted above, the AWWA study found that residents of Seattle and environs used approximately 21,700 gallons per year for outdoor uses. Using the data above, the average difference between average desired use and that allowed by rule can be calculated and ranges from 9,463 and 29,942 gallons per year. Given the above values for use, price and elasticity, the price that would be required for users to voluntarily restrict their water use to an area of 3,360 square feet was determined and the values calculated were between $3 and $35 per year.

Proportionality

Assessing the proportionality of exempt well restrictions involved obtaining parcel data for all parcels in the watershed. These parcels were then analyzed to determine which were not developed and owned by businesses and then matched with data from the Washington Employment Security Department (ESD). This allowed an evaluation of all business-owned parcels that could potentially develop in the future. These parcels were assumed to develop to the maximum number of lots allowed by current zoning and this yielded the potential number of wells that could be installed on site. These numbers were

[21] See AWWA (1999) and Baumann, Boland and Hanemann (1998).

then compared between small businesses and the largest 10% of businesses required to comply and the impacts determined based on cost per employee as allowed by RCW 19.85.

Agricultural Water Use

Agricultural water demand varies with the individual watershed. Some agricultural areas are experiencing an increase in agricultural acreage and potential increased demand for water while others may be experiencing a reduction in water use. In the case of the Stillaguamish watershed, the baseline assumption is that any new water rights approved by Ecology would be conditioned on instream flows and therefore be an interruptible right without the rule.

Agricultural data for individual watersheds is often difficult to obtain. However the USDA agricultural census has been performed every five years for a significant period.[22] As such, it is possible to get county level data for locations in Washington and get a sense of trends. This source provides important data, but it is important to remember that conclusions reached from the data are for the counties in their entirety and may not reflect the specific portion located in the watershed. Table D-6 contains summary data for the counties located within the Stillaguamish basin.

Table D-6. Summary Agricultural and Water Use Data for Snohomish and Skagit Counties.

	Snohomish		**Skagit**	
Year	1997	2002	1997	2002
Farms (Number)	1,819	1,574	999	872
Land in Farms (acres)	72,882	68,612	101,785	113,821
Irrigated Land (acres)	4,397	5,725	10,825	17,658
Top three agricultural products (by value of sales in 2002)	Nursery, greenhouse, floriculture and sod, milk and other dairy products, cattle and cows		Vegetables, melons, potatoes and sweet potatoes, Nursery, greenhouse, floriculture and sod, milk and other dairy products	
Top three agricultural products (by crop area in 2002)	Vegetables, corn for silage or greenchop and hay, haylage, grass silage and greenchop		Vegetables, potatoes, and hay, haylage, grass silage and greenchop	
Irrigation Water Right Permits Issued (1997-2002)	0		0	
Irrigation Water Right Permits Issued (1985-2005)	2		0	

As can be seen, the number of farms has fallen in both counties. However the land in farms has decreased in Snohomish County but increased in Skagit County and irrigated

[22] 1997 and 2002 Census of Agriculture, USDA, National Agricultural Statistics Service.

land is up in both counties for the five-year period despite the fact that no new irrigation rights were issued. This could reflect several factors including use of water that was not being used prior to 1997 or could also represent an increase in irrigation efficiency.

More detailed information can be obtained by looking at the crop mix grown in the various counties. Tables D-7 and D-8 contain the results.

Table D-7. Selected Crops Harvested-Snohomish County

	1992 acres	1992 irrigated acres	1997 acres	1997 irrigated acres	2002 acres	2002 irrigated acres	Percentage Change (irrigated acres) 1992-2002
Corn for Grain	221	D	D	D	D	D	N/A
Corn for silage	N/A	N/A	N/A	N/A	5,119	685	N/A
Wheat	273	0	428	0	420	0	+0.0%
Barley	131	0	199	0	388	D	N/A
Oats for Grain	N/A	N/A	N/A	N/A	57	0	N/A
Dry Edible Beans	N/A	N/A	N/A	N/A	0	0	N/A
Potatoes	D	D	D	D	134	84	N/A
Sugarbeets	N/A	N/A	N/A	N/A	0	0	N/A
Forage-land used in all hay and haylage	19,415	3,600	15,913	1,871	13,929	2,465	-31.5%
Vegetables harvested for sale	4,029	391	3,888	100	2,307	N/A	N/A
Land in Orchards	90	24	94	20	251	128	+433%
Nursery Stock	N/A	N/A	N/A	966*	1,820**	1,248*	N/A

D-Withheld in the Census.
*-Represents outdoor acreage, not necessarily irrigated.
**-Represents total acreage.

The data on crops is a little more difficult to interpret. The largest water users in Snohomish County in terms of acreage are forage, followed by nursery stock, corn for silage, land in orchards, and potatoes. It is apparent from the numbers that the amount of irrigated land in forage has significantly decreased since 1992. However, it appears to be

increasing again since 1997. Since 1992, approximately 1,135 fewer acres are in irrigated hay production. But as noted previously, the total irrigated acres have increased.

Table D-8. Selected Crops Harvested – Skagit County

	1992 acres	1992 irrigated acres	1997 acres	1997 irrigated acres	2002 acres	2002 irrigated acres	Percentage Change (irrigated acres) 1992-2002
Corn for Grain	D	D	D	D	0	0	N/A
Corn for silage	N/A	N/A	N/A	N/A	5,871	550	N/A
Wheat	3,433	D	3,477	D	5,886	190	N/A
Barley	1,264	0	821	0	456	D	N/A
Oats for Grain	N/A	N/A	N/A	N/A	38	0	N/A
Dry Edible Beans	N/A	N/A	N/A	N/A	0	0	N/A
Potatoes	6,794	1,906	6,948	1,571	11,205	4,389	+130.3%
Sugarbeets	N/A	N/A	N/A	N/A	0	0	N/A
Forage-land used in all hay and haylage	19,762	1,349	19,446	723	16,968	1,174	-13.0%
Vegetables harvested for sale	18,056	1,075	16,740	1,263	12,046	N/A	N/A
Land in Orchards	207	85	403	290	438	289	+240%
Nursery Stock	N/A	N/A	N/A	4,861*	7,120**	4,968*	N/A

D-Withheld in the Census.
*-Represents outdoor acreage, not necessarily irrigated.
**-Represents total acreage.

As can be seen there have been changes in Skagit County. Irrigated acreage for potatoes is up significantly. Irrigated acreage for hay fell at first, but has increased since 1997 similar to Snohomish County. Orchard land is also up, but from a relatively small base.

Looking forward it appears that some agricultural crops will be increasing and some may be decreasing. Carrying a projection forward based on the previous five-year period would imply no new demand for agricultural water. However, there are several irrigation water right applications on file currently with Ecology. Ecology believes that most of these would end up being interruptible permits if there was no rule. For most farms, the

likely way to get year-around water would be by using their own rights, purchasing or leasing existing rights, fully mitigating summer uses or perhaps storage of water. For farmers that have existing rights that have been used in some of the declining crops, these could be switched to some of the higher value growth crops. This would require no direct cost and would likely be accomplished as a natural part of the response to changing agricultural markets. For other farmers, purchase or leasing of existing rights would be a viable option. Typically, agricultural rights are priced at about $40 to $120 per acre-foot.[23] For other farmers, costs would rise. Mitigation costs would vary with the specific option. Storage costs per acre-ft of water are likely to vary depending on the site. The rule could potentially increase the storage volume required.

Proportionality

No data is known to be available to determine the number of employees on individual farms, what types of water rights they have and the types of crops they produce. It is known that over 50% of the farms in Snohomish County have value of sales of less than $4,999. For any farm that is required to purchase water, it is reasonable to conclude that impacts would likely be disproportionate.

Impacts to other types of agricultural production could be important. Discussion of cattle, calves and poultry are provided below in Tables D-9 and D-10.

Table D-9. Snohomish County Cattle, Calves, & Poultry

	1992	**1997**	**2002**	**% Change 1992-2002**
Total Cows	53,048	44,255	32,165	-39.4%
Beef Cows	5,143	4,780	3,810	-25.9%
Milk Cows	23,665	21,110	15,604	-34.1%
Other Cattle	24,240	17,556	12,751	-47.4%
Poultry-layers	858,180	768,279	362,301	-57.8%
Pullets	996	N/A	654	-34.3%
Broilers	407,405	301,522	289,752	-28.9%
Turkeys	134	170	186	+38.9%

Table D-10. Skagit County Cattle, Calves, & Poultry

	1992	**1997**	**2002**	**% Change 1992-2002**
Total Cows	46,883	39,692	36,059	-23.1%
Beef Cows	4,464	3,727	4,352	-2.5%
Milk Cows	21,345	20,736	17,021	-20.3%
Other Cattle	N/A	D	14,686	N/A
Poultry-layers	470,663	545,182	D	N/A
Pullets	D	N/A	D	N/A
Broilers	D	D	220	N/A
Turkeys	28	9	6	-78.6%

[23] Based on Columbia River Basin Project for water from "Economics of the Columbia River Initiative."

As can be seen, since 1992 all classifications of cows, and all poultry stocks are declining with the exception of turkeys. Assuming continued trends in this direction indicates little additional impact on water resources.

Municipal Water Use

Conversations with municipal stakeholders indicate most have adequate water through 2025. An exception is the City of Arlington, which has indicated that it might have used all allocated rights by 2011. Ecology is actively working with the City to assess potential needs and supply.

Commercial Water Use

Ecology has only issued one water right for commercial purposes since 1980. It is possible that some that would have used exempt wells were it not for the rule will now have to apply for a permit and mitigate.

Parameters

Discount Rate

Ecology uses the average fixed rates for I bonds to determine the risk-free rate of interest rate. For the period from September 1998 to May 2003, the rate was 2.7%.[24]

[24] http://www.publicdebt.treas.gov/sav/sbirate2.htm